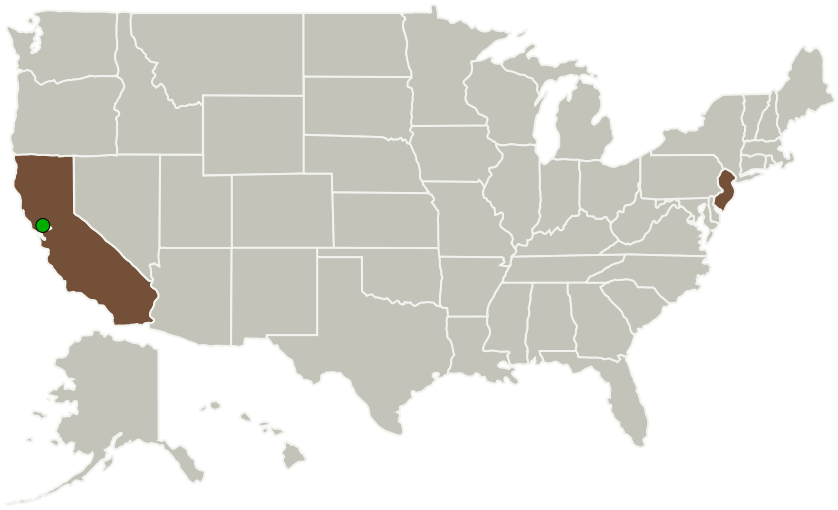
Large Civil Tiltrotor Wake Hazard Assessment Tool, Phase I

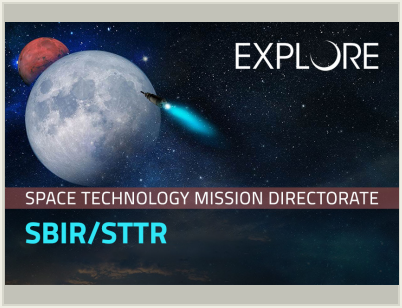
Completed Technology Project (2012 - 2012)

Project Introduction

Both NASA and the FAA have identified large civil tiltrotors (LCTRs) as the most promising method for meeting FAA goals for extending future airport capacity, flexibility, efficiency and safety. This has led to important research at NASA exploring flight dynamics and handling qualities associated with these aircraft in terminal area operations. A critical gap in current research tools is a flight simulation capability to properly evaluate and minimize wake hazards associated with operating large, tiltrotors in the terminal area. These wake hazards will impact flight safety of both the large tiltrotors and any rotary wing or fixed wing aircraft operating in their vicinity. A research effort is proposed to develop and deliver a high-fidelity, physics-based model of these wake hazards within flight simulation evaluation software. Phase I will see the development and validation of prototype software including a new set of metrics for rating handling qualities of comparative LCTR configurations when operating in the wakes of nearby aircraft. Phase II will see the development and delivery of a fully-functional desktop analysis and plug-in module that will provide a capability to feel multiple aircraft wake interactions when flying the LCTR and other aircraft within NASA's Vertical Motion Simulator.

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
Continuum Dynamics, Inc.	Lead Organization	Industry	Ewing, New Jersey
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	New Jersey

Project Transitions

February 2012: Project Start

August 2012: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138242)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Continuum Dynamics, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Daniel A Wachspress

Co-Investigator:

Daniel Wachspress

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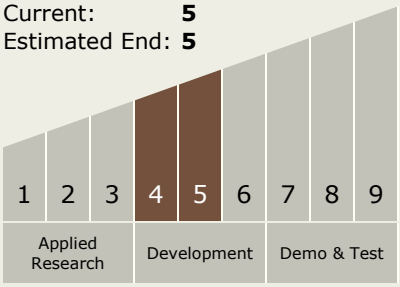
Technology Maturity (TRL)

Start: **4**
Current: **5**
Estimated End: **5**



Technology Areas

Primary:

- TX17 Guidance, Navigation, and Control (GN&C)
  - TX17.5 GN&C Systems Engineering Technologies
    - TX17.5.8 Flying/Handling Qualities

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System